

APPENDIX F

EVALUATION OF ALTERNATIVES

This chapter describes the effectiveness of the alternatives presented in the previous chapter. The evaluation criteria used are described in the first section, an impact assessment is presented in the second section, and a comparison of alternatives is presented in the final section of this chapter.

The evaluation criteria and methods used to quantify the criteria provide the foundation from which the alternative analysis and comparison is based.

EVALUATION CRITERIA

Comparison of alternative packages are made to assess each alternative's effectiveness in meeting the project's objectives and solving the identified project problem statement. Inherent in the Highway 101 Corridor study purpose is the understanding that there are measures of an alternative's "effectiveness" beyond its capacity to accommodate or shift vehicular travel demand. Other Measures of Effectiveness relate to the cost of developing and maintaining the facilities, potential impacts on air quality and energy consumption, and the degree to which the alternative supports modal alternatives to the single occupant automobile. Evaluation criteria were developed to include measures which reflect identified community interests and concerns, as well as, traditional performance indicators for transit and travel demand management strategies. A number of interests and concerns were identified through the public scoping workshop and meetings conducted with the Technical Advisory Committee (TAC) and Community Advisory Committee (CAC).

Issues and concerns fall into the following categories:

Effectiveness in reducing single occupant vehicles and avoiding the need to widen Highway 101

- . Safety
- . Freedom of mobility
- . Cost-effectiveness
- . Minimizing environmental harm and damage
- . Maintenance of a viable and healthy local economy
- . Compatibility with long-term comprehensive planning
- . Integration of transportation modes
- . Maintenance of the area's "quality of life" and character
- . Maximizing "bang for the buck"

By defining a uniform a set of criteria to compare alternatives with one another, a consensus as to which alternative(s) represents the most appropriate solution is possible. The basis for a comparison of alternatives should be defined with performance indicators which measure the magnitude of the problem. The first of four broad categories of evaluation measures is identified as *Measures of the Problem*. The broad issues and concerns identified by the community can be reflected in the last three groups of measures on this list. Identified issues and concerns have been grouped into the latter categories.

Measures of the Problem

- Future congestion, lack of capacity
- Absence of mobility
- Lack of integration of transportation modes
- High rates of single occupant vehicles

Measures of the Solutions

- Integration of transportation modes
- Increase in average vehicle occupancy
- Increase in transit mode split

Measures of Effectiveness

- Freedom of mobility
- Maintenance of a viable and health local economy
- Maximizing "bang for the buck"
- Avoidance of need to widen Highway

Measures of Community/Environmental Impact

- Safety
- Minimizing environmental harm and damage
- Compatibility with long term comprehensive planning
- Maintenance of the area's "quality of life" and character

The individual measures included in each of the categories are consistent with those specified in the United States Department of Transportation (USDOT) metropolitan planning organization's (MPO's) regulations for evaluating major metropolitan transportation investments and with the types of measures used to evaluate multimodal transportation alternatives throughout California. Many of the measures can be applied quantitatively, such as those evaluating traffic volumes or vehicle-miles of travel (VMT). Some assess the effect on the numbers of person trips being made (e.g. telecommunications may eliminate the need for a daily work trip altogether) while others assess the affect of the numbers of vehicle trips (e.g. more carpools or vanpools reduced the number of vehicle trips). Others are qualitative in nature and require subjective judgments. Measures described for each category attempt to address the identified community concerns.

Weighting of evaluation measures is always a much debated concern in most communities. In order to establish the evaluation on a comparative basis for all alternatives, no weighting system has been proposed or is recommended for these measures.

Thresholds of significance as prescribed by local policies or through national or state or local environmental regulations should not be confused with weighting of criteria. Where significance or performance thresholds exist, they have been incorporated in the evaluation measure. An example of a threshold is the area's congestion management program (CMP) which establishes a level of service threshold (LOS D) for roadways and intersections on the CMP system.

Table F-1 lists individual measures used to evaluate alternatives for each of the four categories listed above. Methods used to quantify each measure are detailed in the following section. A general description of each measure is provided in the following material. Detailed descriptions which provide the technical explanation of how a measure was quantified or assessed are found in a technical memorandum entitled *Evaluation Criteria for the Assessment of Highway 101 Alternatives* located in Appendix D. Responses and comments made by the TAC and CAC have been incorporated into the measures.

Measures of the Problem

Criteria considered to be indicators of the problem tend to focus on indicators of travel demand within the Corridor (number of vehicles, vehicle miles of travel) and the resulting levels of congestion (levels of service). Information needed to quantify these criteria was derived from the SBCAG travel forecast model (as described in Chapter 2).

2015 Daily Forecast Traffic on Highway 101

This measure provides a comparison of the number of vehicles (average daily traffic [ADT]) on Highway 101 in the project Study Area in 2015 for each of the alternatives. Differences across the study alternatives in the number of vehicles reflects the effects of each alternative on total trip making, changes in the numbers of trips coming to or through the area, the effect of capacity constraints on Highway 101 travel, and the effect of shifts to bus or rail transit or TDM strategies.

2015 Forecast Daily Level of Service on Highway 101

Level of Service is a comparison of the numbers of vehicles using the roadway and the capacity of the road. The ratio of the traffic volume to the capacity of the roadway indicates the density of traffic flow or the level of congestion predicted on the road. This measure compares the level of congestion on

Highway 101 in the project Study Area in 2015 for each of the alternatives. Figure F-1 provides a graphic representation of the six levels of service which gives a "feel" for traffic conditions associated with each level of service.

2015 Forecast Daily Traffic on Parallel Arterials

This measure provides a comparison of the number of vehicles (average daily traffic [ADT]) on parallel roads in the project Study Area in 2015 between each of the alternatives. The predicted change in the numbers of vehicles using parallel roadways indicates the volume of traffic diverted from the freeway because of insufficient capacity and resulting levels of congestion. Travel behavior, as reflected in traffic models, results in drivers shifting off congested roadways and onto less congested roadways. When freeways become congested and speeds are reduced, drivers seek to find a parallel route as a means of avoiding congestion. A screenline analysis which compares not only the primary highway traffic volumes but also the traffic volumes forecasted for parallel routes will generally result in a balance of total traffic across the screenline. The balance of traffic between the freeway and the parallel alternatives provides a indication of the effect on local streets from each alternative.

Change in Approach Traffic Volumes at Congestion Management Program (CMP) Intersections

The change in approach volumes at CMP intersections is used as a surrogate measure to respond to issues of peak period traffic conditions identified by the TAC/CAC. The CMP defines a system of designated roadways in the county which are important to overall travel in and around the county. The CMP further describes "a countywide program to address congestion problems in a coordinated and cooperative manner between state, regional, city and county transportation and land use planning agencies, transit providers and the Air Pollution Control District." (SBCAG, 1994). Table F-2 includes selected CMP intersections within the Study Area and additional intersections in the Goleta, Isla Vista and west county areas where transit stations are proposed or where local congestion has been a concern. Approach volumes for the year 2015 under each alternative are compared with those in SBCAG's 1994 CMP.

A review of approach volumes for all alternatives was made with approach volumes forecast for the No Build alternative in 2015.

Those intersections which are currently at LOS D or worse were looked at in detail. When volumes increased over the base year level, a review of improvement plans identified in the SBCAG 1993 Regional Transportation Plan (RTP) was made. Those intersections with no improvements planned, increased traffic on approach legs forecast, and current LOS at congested levels were identified for further monitoring and possible improvement

needs.

Estimation of intersection levels of congestion (using either the Transportation Research Board's Circular 212 methodology, or a more simplified intersection capacity utilization (ICU) method), is beyond the scope of this analysis. The forecasted approach volumes provide an indication of future capacity needs at each intersection. Those intersections which have planned improvements identified in SBCAG's 1993 RTP should be able to accommodate future growth in traffic. Conversely, those intersections which are forecast to experience increase in traffic volumes and have no improvements currently planned may experience congestion in the future. No direct method to assess the effect of each alternative on peak period traffic congestion was pursued in this analysis.

Change in Daily Total Vehicle Miles of Travel (VMT) on Highway 101

This measure provides a comparison of the difference (increase or decrease) in the number of miles traveled by vehicles (not people) on Highway 101 between the No Build alternative and each of the Highway Widening alternatives in the project Study Area in 2015. Vehicle miles traveled (VMT) is directly related to the number of vehicle trips on Highway 101 and is also a key variable in calculating air quality and energy impacts. Total VMT provides a measure of the problem with increased VMT potentially leading to higher levels of congestion. This factor is used to assess the amount of VMT operating in congested conditions (LOS E or worse).

Change in Total Daily Vehicle Hours of Travel (VHT) on Highway 101

This measure compares the difference in vehicle hours between the No Build alternative and each of the Highway Widening alternatives in the project Study Area in 2015. The total vehicle hours of travel (VHT) is a measure of both the number of vehicles traveling in the Corridor and the forecast levels of travel delay as compared to free flow traffic conditions. Reduced VHT reflects reductions in delay and/or reduction in the number of total daily vehicle trips. The objective of this measure is to determine the alternatives which generate the smallest increase or largest decrease in VHT compared to the No-Build scenario.

Total Daily Vehicle Trips Produced in the Corridor

This measure compares the number of trips made in vehicles under each of the build alternatives for all trips in the Corridor in 2015. An increase or decrease in vehicle trips is used to measure the effectiveness of the TDM, bus, and rail transit packages to influence decisions on travel mode.

Percent of Total Person Trips in Single Occupant Vehicles (SOV)

This measure compares the difference in numbers of trips made by people driving alone in cars between each of the build alternatives in 2015. The percent SOV trips is used to measure the effectiveness of the TDM and bus or rail transit packages.

The percent SOV is also used in the quantification of air quality impacts.

Measures of the Solution

The methodology used to assess "Measures of the Solution" was obtained from SBCAG travel forecast model trip tables (person and vehicle). The trip tables for the 2015 No-Build (do-nothing) and 2015 Highway Widening alternatives have been developed by SBCAG, based on the recently approved community plans and Forecast '94. The trip tables for each of the alternative packages have been developed based on the SBCAG trip tables and the application of the FHWA/Comsis TDM model. Trip tables contain the estimated trips from each zone in the model to every other zone in the model in a matrix format. Using the SBCAG forecast 2015 trip tables as a starting point, the TDM model was applied to estimate the potential trip reduction capability of the TDM package as defined in Chapters 2 and 3. In addition, the trip tables were adjusted to reflect increased bicycle usage which could be expected with bicycle improvements, and amenities and incentives included in each of the alternatives packages. The modified trip tables for each alternative were used for re-assignment of the trips to the network using the SBCAG travel model to produce forecasts of traffic volumes on each of the roadways in the Corridor. The information needed to assess the effectiveness of each alternative as a solution focuses on the trip making characteristics (e.g. mode choice), as represented in the trip tables, rather than the forecast roadway volumes produced by the traffic assignments.

Total Daily Transit Trips in the Corridor

This measure provides a comparison of the number of transit trips made under each of the build alternatives and the No Build alternative in 2015. (Also referred to as the change in mode split.) This is one of several measures to indicate the success of the bus, rail, or TDM packages in shifting trips into transit or carpools. The number of transit trips is also used to calculate the numbers of buses or rail cars needed to serve the increased demand which is then used in the cost effectiveness measures described below.

Percent of Trips by Transit

This measure provides comparison of the change in the percent of

trips made by transit under each of the alternatives in 2015. Differences in the percent of transit between alternatives are also used to compare the effectiveness of alternative packages in attracting a shift in travel behavior.

2015 Average Auto Occupancy in the Corridor

This measure compares the difference in average auto occupancy (AVO), or the average number of persons per car, predicted under each of the alternatives in 2015. Average auto occupancy is used in the evaluation of the effectiveness of the Enhanced Bus and Rail and the Pricing/Enhanced TDM Alternatives packages. AVO is then compared with occupancy rates achieved with the Highway Widening alternative. Changes in average auto occupancy under the Enhanced Bus and Rail alternatives reflect the application of the existing TDM program, fully realized, on the daily travel behavior.

Percent of Trips by Bicycle

This measure compares the total percent of all person trips made by bicycle as compared with the total number of person trips in the Corridor for each of the alternatives in the 2015. This is used to compare the effectiveness of each of the alternative packages in shifting the person trip away from a vehicle trip and into a nonmotorized trip. These numbers may be used as an indication of the interconnectivity between modes and the effectiveness of a strategy in shifting modes. Bicycling offers financially attractive opportunities to reduce vehicular traffic and its associated impacts within the Corridor. Improvements to bicycle facilities are typically far less expensive in comparison to the costs associated with major highway improvement projects such as the proposed Highway 101 widening, or the implementation of major transit improvement projects.

Net Change in Daily Vehicle Trips in the Corridor

This measure compares the number of vehicle trips in the Corridor. Other measures consider volumes on either the highway or the parallel arterials. The change in daily vehicle trips measures the effectiveness of each alternative in reducing trips that start in the Corridor as well as those that start outside of the Corridor. This reflects changes to both visitor or tourist trips as well as commute trips. Daily vehicle trips includes transit trips, the increased numbers of bus trips or rail trips made, as well as nonmotorized trips and carpool trips.

Measures of Effectiveness

Cost effectiveness is one concern frequently mentioned at the public scoping meeting and at several TAC/CAC meetings. Measures of effectiveness focus on the relative cost of each scenario compared with the benefits each offers. The first measure, which applies to all alternative packages, compares total cost to the number of person trips served. The next three measures apply only to the alternative packages which have been developed as part of this alternatives analysis. These measures compare the costs of the various packages to the levels of trip reduction each package is estimated to achieve, as a measure of cost-effectiveness. Costs for TDM programs are based on current (FY 1993-94) costs which SBCAG's Traffic Solutions office expends in serving the existing 426 employers and providing ridesharing services to the general public in the Santa Barbara/Goleta area.

The cost estimates for the highway widening alternative were obtained from the draft EIR/EIS prepared by Caltrans and from Caltrans Highway maintenance staff. The cost estimates for the alternatives packages have been developed based on preliminary engineering and conceptual operating plans for each alternative. These cost estimates are summarized in Chapter 3 and were developed with input from MTD, Traffic Solutions and Caltrans.

The estimates of person trips and vehicle trips used in these analysis were based on 2015 forecasts from the SBCAG travel model trip tables and traffic assignments. These are described in the Measures of the Problem and the Measures of the Solution sections above. To establish the reduction of vehicle trips achieved under each scenario, the estimated vehicle trips for each scenario were compared to the estimated vehicle trips for the No-Build scenario.

Annualized Total Cost Per Vehicle Trip Reduced

This measure compares the cost of construction and the cost of operating and maintaining each alternative package with the number of vehicle trips reduced by the alternative. The measure indicates the cost effectiveness of each alternative by comparing total project costs with the total numbers of trips reduced by an alternative.

Annualized Capital Cost Per Vehicle Trip Reduced

This measure provides a comparison of capital costs to the numbers of vehicle trips reduced or eliminated by each alternative. Capital costs include construction and right of way costs for highway widening or rail transit packages, and include bus or rail vehicle purchases and station construction for the bus or rail transit packages. Annualized capital cost per vehicle trip reduced provides a comparison of the

effectiveness of each of the alternatives packages in reducing trips relative to the capital cost of implementing the measures contained in the package. It may be that one alternatives package results in slightly fewer vehicle trips along Highway 101 than the other two packages, but is significantly more costly to construct.

Annualized Operating and Maintenance Cost Per Vehicle Trip Reduced

This measure provides comparison among alternatives of the ratio of the annual operations and maintenance costs to the number of vehicle trips reduced by the alternative. This is one of the measures which provides an indication of the "bang for the buck" of each alternative. This measure compares the costs to operate and maintain each of the packages with an indicator of reduced congestion or the number of vehicle trips reduced. The lower the cost per vehicle trip, the better the "bang for the buck".

Measures of Environmental/Community Impact

The following measures are intended to provide a basis for comparing the potential environmental, social, and community impacts associated with each of the alternative scenarios for the Highway 101 Corridor. Potential impacts of each scenario were developed based on preliminary planning and engineering estimates, information derived from SBCAG's travel model, local growth and land use plans, and assumptions and factors derived from national, state and regional studies. The technical documentation to support the application of the air and energy measures is included as a Technical Appendix. Air quality and energy consumption impacts are quantified in grams per day and British Thermal Units (Btu's), units typically calculated for these types of impacts. Social impacts receive a more subjective rating system with a plus "+" indicating a positive impact, an "X" indicating no perceived impact and a "--" indicating a negative impact as a result of the alternative.

The identification of a measure to address future safety within the Corridor was considered. No appropriate method of assessment was identified. The Institute of Transportation Engineers' *Transportation and Traffic Engineering Handbook* states: "In general, transportation accidents are caused by failure of one of the three major elements of a transportation system: the human (driver or engineer), the vehicle, or the guideway/environment." (Cantilli, in ITE 1982). Accident occurrence, severity (in terms of fatalities, injuries, or property damage) and rates provide a statistical basis from which to assess safety performance. At highway intersections a rate based on the number of vehicles entering an intersection is more appropriate than total two way volume. Studies based on these factors all require historic data. Future accident rates are not predictable since the reliability of such forecasts are

questionable. To extrapolate from historic rates is to discount the human factor in accidents. Therefore, no safety measure has been estimated as part of this analysis.

Forecast Daily Running Vehicular Emissions in the Corridor

A partial measure of the air quality impacts which are expected to result from each of the alternatives. Estimates were prepared of vehicular running emissions for Reactive Organic Gases (ROG), Oxides of Nitrogen (NOx), Carbon Monoxide (CO), and for particulate matter 10 microns or larger in size (PM10) for each alternative scenario. Estimates were developed using daily vehicle miles of travel (VMT) generated by the SBCAG travel forecast model, and Air Resources Board composite emissions factors (EMFAC 7F1.1 for the 2015 year). Emission estimates are for comparison purposes only and do not reflect a complete air quality analysis. This community and environmental impact measure provides an order of magnitude comparison of the emissions generated from each alternative with those generated by the No Build alternative. Emissions calculation worksheets are found in Appendix 1.

Emission reductions calculated in this analysis will not be consistent with those generated in the air quality analysis of Caltrans' Draft EIR for the Highway 101 widening for several reasons. The method of analysis is not consistent with the method(s) used in the DEIR. This analysis uses a more recent set of emission factors than those used in the DEIR factors (EMFAC 7F1.1 rather than EMFAC 7EP). Running emissions only are calculated in this comparison. No cold start or hot soak evaporative emissions factors were included in this comparison because no reliable method was determined to estimate the numbers of vehicles which start or stop a trip outside of the Study Area.

2015 Forecast Transportation Energy Consumption

This measure provides a comparison of the energy consumed by vehicles under each alternative package with the energy consumed by automobiles under the No Build alternative. This measure indicates which alternative conserves the most energy. Estimates of 2015's single year highway mainline direct energy consumption were prepared for each alternative, based on the traffic volume forecasts. Direct energy refers to energy consumed through the fuel consumption of light duty, medium duty, heavy duty and rail vehicles. No indirect or construction energy use estimates were developed as this is a planning level study and no design-level information is available. The estimates of energy consumption were based on forecast volumes, estimated vehicle mix (e.g. light, medium and heavy duty and percent diesel vehicles), forecast speeds and daily vehicle miles of travel. Methods used to calculate the 2015 energy consumption follow the VMT methods and assumptions found in

Caltrans' *Energy and Transportation Systems*, July 1983. The community and environmental impact measure is a comparison of the direct energy consumption for each alternative with the direct energy consumed in the No Build alternative. Energy calculations are found in Appendix 2.

Neighborhood Intrusion/Impact on Community Character

This measure provides a subjective evaluation of the compatibility of each alternative with local neighborhoods. The measure attempts to address the issues of maintenance of the area's "quality of life" through the qualitative assessment of each alternative's contribution to increased noise, increased traffic, and the impact on existing land uses. Neighborhood intrusion impacts were assessed through a two part evaluation. First a comparison was made of future traffic volumes on parallel arterials between the No Build and all alternatives, comparing future ADT of each alternative package with the ADT of the No Build alternatives on the same streets. Changes in daily traffic volumes were rated using the following scale:

<u>Percent Decrease in ADT</u>	<u>Rating</u>
> 50% decrease	+
25% - 50% decrease	X
< 25% decrease	--

The second factor considered in this evaluation considers the qualitative effects of increased numbers of transit vehicles on the areas' roadways as a result of each alternative package. Increased bus traffic is assumed to increase both noise and localized smog on the neighborhood streets. "Transit noise is generated by transit vehicles in motion. Vehicle propulsion units generate: (1) whine from electric traction motors that propel rapid transit cars, (2) diesel-engine exhaust noise, from both diesel electric locomotives and transit buses, (3) air-turbulence noise generated by cooling fans, and (4) gear noise.

Additional noise of motion is generated by the interaction of wheels/tires with their running surfaces. Tire noise from rubber-tired vehicles is significant at normal operating speeds.

Sources of noise at stations include automobiles associated with patrons arrival and departure especially in the early morning, buses idling, train horns, locomotive idling at rail terminal stations" (*Federal Transit Administration Draft Guidance Manual for Transit Noise and Vibration Impact Assessment*, 1993). The conceptual nature of this analysis prevents a detailed noise evaluation. MTD plans to transition to all alternatively fueled vehicles by the year 2015 in accordance with state and federal clean air mandates. Electric powered vehicles with overhead wire power pick-up or battery power, are generally quieter than traditional internal combustion engines. CNG, LNG, or methanol powered buses rely on a more traditional internal combustion engine which may not be significantly quieter than conventional diesel buses.

Noise-induced annoyance is broader concept which may serve as the basis of an evaluation. Fidell and Green (*in Handbook of Acoustical Measurements and Noise Control, C.M. Hill, 1991*) describe noise-induced annoyance as "an attitude: a covert mental process with both acoustic and nonacoustic determinants...Annoyance is often described as a generalized adverse attitude toward noise exposure" (Hill et. al.) While psychophysical methods for establishing the annoyance of noise exist, a more subjective method of comparison is used, one based on increased headways on existing bus routes, new bus routes in areas where none previously existed. A simplified rating system was applied based on the bus routes for which increased headways or new service were proposed.

<u>Change in Bus/Train Route Frequencies</u>	<u>Rating</u>
Frequencies increase by less than 2 times	+
Frequencies increase 2 times	X
Frequencies increase 3 times	--

Compatibility of potential transit station/bus stop locations with existing adjacent land uses was also considered. Proximity of the generally proposed transit station locations to existing hospitals, schools, parks or other publicly used amenities was considered a positive impact near these facilities are considered trip attractors. SOV trips may be reduced as a result of either increased frequency on some lines or the availability of transit service to previously unserved facilities on recommended service routes. Loss of on-street parking or the removal of existing land uses due to a station location are beyond the scope of the analysis of conceptual station locations included in this study. The need for local street reconfiguration identified for stations in Chapter 3 will serve as a basis for a negative impact. Highway widening impacts was based on those socioeconomic impacts identified in Caltrans' Draft EIR. A simplified rating system was applied to each station or bus stop location.

<u>Station Compatibility with Existing Land Uses</u>	<u>Rating</u>
Commercial	+
Industrial	+
Multifamily Residential	+
Single Family Residential	X
Special Generators (schools, hospitals)	+
Resort/ Tourist	+
Local street reconfiguration potential	--

Compatibility with Long-Term Comprehensive Planning

This is a measure which compares the adopted general plan land uses with the Corridors and stations recommended in each of the alternative packages. This measure will provide a general assessment of each alternatives' compatibility with adopted long

range plans in the Study Area.

A screening level assessment was made to evaluate the compatibility of each alternative's route and station or major interchange locations with adopted general plans for the City and County of Santa Barbara and City of Carpinteria. Station locations proposed in the rail and bus transit options do not reflect precise locations. However general plan land uses in the general vicinity of the recommended sites were considered in this evaluation. General plan land use designations were reviewed to determine which conceptual station locations are compatible with local land use plans. Those land uses which support or enhance transit ridership - multifamily, commercial or public facility types of land uses - would be considered compatible and supportive of enhanced bus and rail transit packages. Resort and tourist attractions were also considered as compatible uses.

<u>Route/Station Compatibility with Planned Land Uses</u>	<u>Rating</u>
Commercial	+
Industrial	+
Multifamily Residential	+
Single Family Residential	X
Special Generators (schools, hospitals)	+
Resort/ Tourist	+

Impacts to Vegetative Cover

This measure provides a qualitative comparison of expected loss of vegetation along the primary Corridor route for each of the alternatives with ratings of no impact on vegetation rated as "+", of medium impact to vegetation as "X" and wide scale removal of vegetation as "-". Caltrans Draft EIR for the Highway 101 widening project identified impacts to vegetation. This analysis serves as the basis for the impact assessment for the widening alternative. A more subjective evaluation process has been used to assess impacts to vegetation for the other alternatives. All other alternatives are at a conceptual stage of development and detailed alignments or siting options have not been selected. A windshield survey of potential rail and transit stations was used as the basis for the vegetation evaluation. No biological assessment was made of floral species present within potential Corridors or on potential transit or rail station sites. Ratings of low impact (X) were given when undeveloped properties supported no significant stands of trees, shrubs, or ground vegetation. Ratings of high impact (--) were given when undeveloped properties supported stands of trees, shrubs, or ground vegetation.

<u>Vegetative Cover</u>	<u>Rating</u>	
No major stands of trees or little ground cover removed		+
Some stands of trees or ground cover removed	X	
Mature trees and extensive ground cover removed	--	

IMPACT ASSESSMENT

The travel demand forecasting models used to produce estimates of future travel for each of the alternatives were the SBCAG travel forecasting model in conjunction with the FHWA/Comsis TDM model. The FHWA/Comsis TDM model is a travel forecasting tool used to estimate the travel demand responses to changes in both TDM policies and programs as well as changes in travel times or costs induced by changes in transportation services.

The TDM model is based upon observed, national experience from actual before and after conditions of travel in response to changes in TDM programs and policies (from dozens of locations across the U.S.) or changes in transportation services such as improvements in transit service or impositions of parking charges or other travel-related fees. The model was adapted for use in this study by adjusting the sensitivities in the model to forecast not only changes in mode choices and travel frequencies for work travel, but also non-work and visitor/tourist travel response based upon observed sensitivities in several other urban areas in the U.S.

The forecasts of future travel for each alternative also form the basis, either directly or indirectly, for many of the evaluation criteria used to compare the alternatives. The costs (capital, operating and maintenance) of the alternative packages were summarized in Chapter 3 and are used to compute the Measures of Effectiveness criteria. Measures of Environmental/Community Impact are a combination of quantitative and subjective assessments of these measures. Table F-3 presents the results of the computation of the evaluation criteria for each of the alternative packages, as well as the 1992 base year traffic values and the 2015 "No-Build" conditions as a basis of comparison with the alternatives. The No Build alternative provides the basis against which all alternatives are compared. A comparison of the year 2015 No Build alternative with the existing (1992) base year data reflects the results of increases in traffic and congestion due to planned growth in all of the communities within the Study Area, as well as increase in traffic from outside the area and traffic which travels through the area due to increased growth in the surrounding counties. A comparative discussion of each alternative's performance follows.

Measures of the Problem

Forecast Daily Traffic Volumes and Levels of Service on Highway 101

Forecast traffic congestion is, in general, greatest under the No Build alternative. Average daily traffic (ADT) volumes are less than those predicted under the Highway widening alternative

because there is no capacity on the freeway for more vehicles during peak periods. Congestion levels on the Highway 101 Corridor are slightly higher than those produced by either the bus or rail transit packages. The No Build alternative will not adequately accommodate forecast year 2015 traffic and will result in degraded levels of service of E and F during peak periods (see previous Figure F-1) on Highway 101 between Milpas Street and the Ventura County line. Daily traffic volumes on Highway 101 are predicted to grow from the 1992 base year's 81,000 ADT south of Salinas Street to 94,700 ADT in 2015, an increase of 17 percent under the No Build alternative. Between Santa Barbara and Montecito, traffic is predicted to increase by 24,500 vehicles per day or by 25 percent. Highway 101 traffic is predicted to increase by 32 percent in the Summerland area, and by 31 percent in the Carpinteria area. All alternatives are compared against this predicted No Build condition.

The proposed Highway Widening alternative will accommodate forecast year 2015 traffic at LOS D or better on all of the freeway segments analyzed. The highest forecast traffic volumes are expected to occur on Highway 101 south of Salinas Street with average daily traffic (ADT) forecast as 111,900 vehicles per day, a LOS D flow condition (see previous Figure F-1). The Enhanced Bus and Rail Transit alternatives reduce Highway 101 traffic volumes on the four representative segments to ADT levels below those forecast for the No Build alternative. Both alternatives reduce traffic levels on Highway 101 approximately one to three percent below No Build forecast levels. Average daily traffic volumes are forecast to range from 80,000 vehicles to 92,000 vehicles along the Corridor, about 10,000 to 20,000 per day less than the Highway Widening alternative (with its two additional lanes). Estimated volume to capacity ratios are forecast to be lower than those predicted for the No Build alternative, but not low enough to improve the overall level of service rating. The nearly equal forecast ridership is a consequence of the two packages offering almost identical travel times and fares to potential users along the Corridor. While the travel time of the rail service is slightly shorter than the Enhanced Bus alternative in the Corridor, the Enhanced Rail alternative results in somewhat longer travel times than the Enhanced Bus alternative because of waits for access and transfers. Also recall that the Rail Transit alternative includes express bus service from Ventura to downtown Santa Barbara in addition to the rail transit service between Carpinteria and Isla Vista.

The Pricing/Enhanced TDM Alternatives alternative results in the greatest reductions of both levels of congestion and daily traffic volumes of the three alternatives to the Highway Widening alternative. Resulting levels of congestion predicted for the Pricing/Enhanced TDM Alternative however, are not as low as those predicted under the Highway Widening alternative, Those portions of Highway 101 in the Monticeto area are

predicted to be operating at LOS E, in excess of the CMP established levels of congestion. Remaining portions of Highway 101 in the areas of Santa Barbara, Carpinteria and south towards the Ventura County line are forecast to operate at LOS D.

Forecast Daily Traffic on Parallel Arterials

Daily traffic volumes on the major parallel arterials, as measured at the screenlines (see Chapter 2 for a description and location of screenlines), is higher in 2015 under the No Build alternative than 1992 volumes.

The Highway Widening alternative results in the greatest reductions in daily traffic volumes on the major parallel arterials. Forecast traffic volumes on many parallel arterial streets will be reduced substantially from ADT predicted under the No Build alternative. In the Santa Barbara area, the three parallel arterials are predicted to have traffic volumes 37 to 56 percent less than would occur in the No Build alternative. In the Montecito area Highway 192 is predicted to have ADT reduced by 85 percent over the No Build alternative. Only North Jameson Lane is predicted to experience an increase in traffic, a significant increase over the 2015 No Build estimated daily traffic volumes. This is due to the road's ability to continue to serve as a frontage road to Highway 101. This increase may result in significant congestion at this ramp.

The Pricing/Enhanced TDM Alternative results in the largest reductions in daily vehicle trips on Highway 101 and the lowest amounts of congestion on the highway of all of the widening alternatives. The parking surcharge component of this package is a key contributor to the large reductions in daily volumes. The modified work weeks, as well as the incentive to carpool provided by the parking surcharge included in this alternative, result in reduced volumes, particularly in the home-to-work or commuter markets. The reduced congestion and the improved travel times under either the widening or the TDM alternative are expected to reinforce the travel choices made by commuters.

The Enhanced Bus and Rail alternatives are predicted to decrease forecast traffic volumes on parallel arterials between 100 and 500 vehicles per day (by from one to three percent) than volumes of the No Build alternative. These decreases occur in the Santa Barbara, Montecito and Carpinteria areas. The combination of the increased bus service frequencies and the rail station locations in Carpinteria and Montecito result in interconnected bus and rail service which not only provides traffic relief on the Highway 101 Corridor but on the local arterials as well. The Summerland area is predicted to experience a substantial increase in traffic, an additional 1500 vehicles per day, on Highway 192 due to the higher levels of congestion on Highway 101. North Jameson Lane traffic volumes in the Summerland area are predicted to stay constant with those of the 2015 No Build

alternative. The reductions in traffic volumes on the parallel roadways predicted from the Enhanced Rail package are not as significant as those predicted for the Highway Widening alternative due to the congested conditions predicted for Highway 101. Access to bus or rail stations will still continue primarily by automobile with this traffic collecting on the parallel arterials and other major streets in each community.

Congestion Management Plan (CMP) Intersections

CMP intersections identified in Table F-2 (see previous section 4.1) were reviewed for the estimated increases in approach volumes over the 1992 base year levels and for changes when compared with approach volumes estimated for the No Build. Planned and programmed improvements identified in SBCAG's 1993 Regional Transportation Plan were identified in the table. The majority of CMP intersection approach volumes are predicted to decrease over those levels predicted for the No Build alternative. Those intersections which are currently at level of service D or E and which have no Regional Transportation Plan improvement identified were considered to have a potential congestion problem. Three CMP intersections meet this criteria: the Highway 101 Northbound off ramp at Las Positas Road, the Highway 101 Northbound ramp (Earl Warren Park) at Calle Real, and Calle Real/Highway 101 at State Street. The CMP intersection of Route 154 and State Street, although currently operating at LOS D, has widening improvements planned and the forecast approach volumes are less than or equal to base year volumes under all of the build alternatives. The CMP intersection of Highway 101 Northbound at Milpas Street also experiences intersection level of service D today according to the 1993 CMP. All forecast volumes are predicted to be lower than the 1992 base year forecasts. In addition, the Regional Transportation Plan identifies an intersection widening improvement. Therefore no further discussion of these two intersections is included. Approach volume forecasts estimated under each of the build alternatives are described below for the three intersections identified earlier.

Total Hours of Travel and Average Daily Speeds on Highway 101

Daily average speeds and total hours of travel on Highway 101 provide an indication of the success of each alternative at meeting growth in travel demand. Although hours of delay is typically used as a performance measure, the absence of peak period travel times and speeds prevents a realistic measure of delay for all alternatives. Therefore, total hours of travel on Highway 101 is used to provide an indication of the effect of resulting congestion on the total time traveled on the highway.

Differences in total hours of travel are due to differences in levels of congestion experienced on the highway or the differences in the amount of travel occurring on the highway. The lowest amount of hours of travel attributed to the Highway

Widening alternative is due primarily to the reduced congestion and improved travel speeds. The additional capacity reduces congestion which in turn allows faster average travel speeds. Cost of congestion or delay would be the least under this alternative. The Pricing/Enhanced TDM Alternative also produces lower levels of hours of travel and faster speeds. Differences in hours of travel in this alternative are primarily due to trips not being made rather than due to improved travel speeds.

Hours of travel on Highway 101 are forecast to be nearly identical under either the Enhanced Bus or Rail Transit alternatives due to the similar shifts in mode made by SOV drivers to bus or rail transit. Cost of congestion would be lower for either the Enhanced Bus or Rail Transit alternatives than for the No Build alternative.

Average speeds under current conditions are estimated at 55 miles per hour. This is not the travel speed experienced during peak period congestion, however it does serve as a relative indicator of the average speed throughout the day. With no improvements or alternatives, average speeds are predicted to drop by more than half to as little as 27 miles per hour. This is a direct result of the forecast increased number of daily trips within the Corridor with no increased capacity, either transit or highway. The Highway Widening alternative results in the greatest improvement in average daily travel speeds on Highway 101 with average daily speeds estimated at 42.5 miles per hour. This is closest to today's average speeds. The Enhanced Bus and Rail Transit alternatives are predicted to bring average daily speeds on Highway 101 back to half of today's levels at 28 miles per hour. The similarities in travel speeds for these two alternatives are based on the similarities between the numbers of total daily vehicle trips forecast for each of these alternatives and the associated levels of congestion which are expected to occur on Highway 101. These speeds and the associated total daily hours of travel for vehicles serve to reduce the desirability for carpooling in the Corridor and bring transit based travel times in to closer parity with travel times experienced by those driving on the freeway under these two alternatives. Forecast travel speeds under the Pricing/Enhanced TDM Alternative are better than those experienced under either the Enhanced Bus or Rail alternative, with forecast average daily speeds increasing to 32 miles per hour. This estimate reflects the forecast congestion on Highway 101, for the TDM alternative as well although not as great as expected under the two transit alternatives.

Total Daily Vehicle Trips, Daily VMT, and the Percent of VMT Operating at Level of Service E or F in the Highway 101 Corridor

The forecast increases in daily vehicle trips in the Corridor between 1992 and 2015 result in an increase in total daily vehicle miles traveled (VMT) of nearly 44 percent. Forecast VMT is more than 373,000 miles per day higher than in 1992. Under

the No Build alternative, thirty-three percent of the daily VMT in the Corridor in 2015 is forecast to be operating at LOS F and another 67 percent at LOS E. The least amount of congestion among the alternatives is forecast as a result of the Highway widening alternative. The greatest reduction in vehicle trips, lowest levels of VMT and the least percentage of Highway 101 operating at congested levels results from the Pricing/ Enhanced TDM Alternative, with its \$3 per day parking surcharge. Only one segment of Highway 101, south of San Ysidro Road, is forecast to be operating at LOS E or F. Associated daily Study Area VMT is forecast to be 1,340,000 per day, a 57 percent increase over 1992 levels and nine percent greater than the year 2015 No Build condition. Trip increases above the No Build alternative are due to higher speeds and less congestion in the Highway 101 Corridor resulting from the highway widening.

Approximately 446,100 daily vehicle trips are forecast to be made in the Corridor in 2015. The Enhanced Bus alternative will result in a reduction of approximately 23,000 vehicle trips per day. Associated daily Study Area VMT is forecast to be 1,207,000, which is 124,000 or 9 percent below the Highway 101 Widening forecast, but 42 percent higher than the 1992 base year volumes. Levels of congestion will be highest under the Enhanced Rail alternative as trip reduction is lowest under this scenario. The Enhanced Rail alternative would produce total daily vehicle trips in the Corridor which are essentially identical (approx. 400 less) with the enhanced bus transit package. Generally, this can be attributed to greater access to freeway bus transit stations than rail transit station locations. Total vehicle miles of travel are predicted to be one percent less than those predicted for the No Build alternative, ten percent less than the estimated VMT for the Highway Widening alternative, and essentially (500 - 600 per day) with the Enhanced Bus Transit package.

Percent of Total Vehicle Trips in Single Occupant Vehicles (SOV)

The forecast number of single occupant vehicles are expected to be a slightly greater percent of the total trips in the 2015 No Build condition (67 percent) than in the 1992 base case (63 percent). The percent of SOV trips under the Enhanced Rail or Bus alternatives are forecast to remain relatively high at 61 and 60 percent respectively of the total daily vehicle trips. These percentages are five or six percent less, however, than under the No Build alternative and five percent less than the fraction of SOV trips in the Highway Widening alternative. The increased bus service or rail service attract a fraction of the forecast SOV trips compared with the No Build. The \$3 per day parking surcharge program of the Pricing/Enhanced TDM Alternative provides trip-makers with the greatest incentive to shift to carpooling, thereby reducing the forecast fraction of SOVs to 48 percent. Additionally, the financial incentives proposed for carpooling in the Pricing/Enhanced TDM Alternatives package, combined with preferential parking and its associated reduction in travel time for commuters, results in the greatest reduction in SOV trips.

Measures of the Solution

Total Daily Transit Ridership and Percent of Transit

Growth in the Santa Barbara area accounts for the increase in transit ridership between the existing conditions and the 2015 No Build alternative. Some limited growth in transit services is assumed to occur, at least to the levels proposed in the area's short range transit plan, to meet the increased numbers of riders. The overall percentage of transit will increase slightly (from 1.9 to 2.0) due to the high levels of traffic congestion predicted and the resulting increases in auto travel times. These delays serve to make transit service somewhat more competitive with the time it will take to drive. (Though buses operating on streets in mixed-flow traffic will suffer from the same traffic congestion.) This results in the slightly higher percent of trips made by transit.

The three alternative packages (Enhanced Rail, Enhanced Bus and Pricing/Enhanced TDM Alternatives) all achieve greater transit ridership levels than those forecast for the highway widening alternative. Improved traffic flows and a highway Corridor operating with no VMT in stop and go or congested traffic in the Highway Widening alternative effectively eliminate any incentive for trip making to shift modes to transit. Both the Enhanced Bus and Rail and Transit alternatives dramatically increase transit service levels and intermodal service connectivity significantly, which result in the more than tripling of the daily numbers of transit riders.

The tripling of transit ridership as a result of the Enhanced

Bus Transit Package can be attributed to the addition of Express Bus service in the Highway 101 Corridor itself, which provides commuters an alternative to driving along in congested traffic.

New or enhanced bus service levels both to and around the proposed freeway transit "stations" provide for quicker trips and less waiting time at stations for transfers from the Express Bus service into the downtown areas. The frequency of peak period service in the Carpinteria area is tripled on existing MTD bus routes as it is on most existing service which connects directly with the proposed freeway transit stations. Increased service along with the proposed new shuttle service both provide direct access to proposed freeway express bus stops. The addition of new evening local bus or shuttle service in Montecito, Santa Barbara, and Isla Vista areas on designated lines, which connect with new evening express bus service along the Corridor provides Corridor area residents and visitors the ability to travel by bus where little or no opportunity existed before.

The Enhanced Rail Transit Package attracts essentially the same level of transit ridership as the Enhanced Bus Transit Package for several reasons. The new rail service is complemented by express bus service in this package resulting in travel times which compete favorably with the congested levels of service forecast on the Highway 101 freeway. New shuttles proposed in the Carpinteria area, the City College area and the new shuttle along Ward Memorial Boulevard between UCSB and the freeway provide increased service focused on trip attractors, particularly the schools, which traditionally have greater transit patronage. Conversely, the somewhat shorter travel times offered by the rail transit line compared with the express bus is offset for many potential riders by the additional time needed to transfer between feeder buses and shuttles to/from the proposed rail line.

The Pricing/Enhanced TDM Alternative provides incentives (and a \$3/day disincentive) to shift modes to transit, carpools or vanpools, however there is not a corresponding proposed change or expansion to existing transit services to attract great numbers of riders to transit under this package. Hence most of the mode shift is forecast to be from drive alone to carpool. In those areas where transit service levels are higher, an increase in transit ridership can be predicted. The majority of trips will shift to carpools or vanpools as a less costly means for commute trips as well as non-work trips. The absence of any express bus service or enhanced rail service, beyond the planned increase in the San Diegan service, will result in little impact to tourist decisions to arrive by transit, and will also limit the numbers of home-to-work trips which would shift to transit.

The highway widening alternative results in the lowest levels of transit ridership and percent transit. The improved traffic conditions compared with the No Build - no portions of the Highway 101 Corridor operating at congested levels of service - has the effect of attracting more cars to the highway. Travel times in cars or single occupant vehicles can be expected to be shorter than those for the future, (existing levels of) bus services, the effect being to reduce transit demand over projected levels under the No Build alternative.

2015 Average Auto Occupancy (AVO)

Average occupancy rates in the Corridor are predicted to experience the greatest increase under the Pricing/Enhanced TDM Alternative, increasing from 1.43 persons per vehicle to 1.71 persons per vehicle primarily due to the parking fee program analyzed as part of this alternative. Daily savings of the proposed parking fee if carpooling or vanpooling, provides the impetus to the work related or all day parking trip maker to share a ride. The analyzed parking tax was assumed to cost drivers of single occupant vehicles \$60 dollars per month (\$3.00 per day per auto X 20 average working days per month).

Individuals who carpool avoid a portion of the fee - \$0 .75 per vehicle per day. Table F-4 indicates the cost savings per month for one, two, three and four plus person carpools. Transit ridership is also positively affected under the Pricing/Enhanced TDM Alternative parking strategy due to the subsidy of \$0.50 per day each rider would receive.

The parking fee program is expected to have a limited impact on visitor and weekend travelers to the Corridor. The impact on weekend and visitor trips is expected to be less than on the daily commute trips as vacation trips have a higher auto occupancy generally than other trips. The intercept travel survey results support this conclusion. Sunday peak period average vehicle occupancy was calculated at 2.18 persons per vehicle. Only thirty percent of the observed vehicles had one occupant as observed during the Sunday PM peak southbound survey, while the weekday evening peak period observed drive alone share was 71.1 percent. The continuation of the 90 minute free parking program is expected to apply to the majority of visitor and non-work related trips. Although overnight stays could result in some application of the enhanced fee program to visitors to the area, most are expected to receive some subsidy due to the higher auto occupancy rate for these travelers.

Table F-4
Costs and Cost Savings
Parking Fee Element of Pricing/Enhanced TDM Alternatives
Package¹

Carpool Size	Monthly Costs if Drove Alone	Cost to Carpool	Monthly Savings/Car
Drive Alone	\$ 60.00	\$ 60.00	None
Two Person	\$ 120.00	\$ 45.00	\$ 75.00
Three Person	\$ 180.00	\$ 45.00	\$ 135.00
Four + Person	\$ 240 - \$420	\$ 45.00	\$ 195 - \$37

¹ Costs based on assumptions used in TDM analysis and may not reflect actual pricing structures.

AVO predicted for both the Enhanced Rail Transit Package or the Enhanced Bus Transit Package is assumed to be higher than Highway Widening alternative at 1.46 persons per vehicle. The slightly higher AVO is due to the fuller implementation of the basic TDM elements which were assumed to be implemented along with the transit alternatives. AVO for the No Build alternative is predicted to be nearly identical to today's levels as calculated from project travel survey results. No travel time savings or cost savings will result from the No Build alternative which could provide an impetus to increase the shift

to carpools or transit. The absence of a planned or programmed ramp metering program in the Highway 101 Corridor limits incentives to shifting to carpools in any of the alternatives. Increased travel speeds for all vehicles reduce the incentive to carpool. This assumption is the basis of the SBCAG auto occupancy model component.

Percent of Trips by Bicycle

No change is predicted in the percent of trips made by bicycles in the No Build or the Highway Widening alternative over today's levels. The addition of bicycle facilities (see Figure 3.1 in Chapter 3), if funded, would provide an enhanced network on which to travel. Bicycle travel can be expected to have greater reductions in the visitor and weekend trips as a result of the expanded bicycle facilities. No firm plans have been developed by MTD for enhanced bicycle accessibility on the bus system at this time, although an initial bike rack on bus equipment testing study was completed by MTD and further studies are expected. Connectivity with the existing bus service would be enhanced with the completion of the planned bicycle facilities.

For these reasons, the percent of trips made by bicycles under either the No Build or the Highway widening alternative is predicted to be equal.

Increases in the percent of trips made by bicycles under either the Enhanced Rail or Bus Transit packages (0.88 percent of daily person trips) can be attributed in some part to the interconnectivity between planned bicycle improvements and proposed transit and rail stations or services. The two alternatives assume additional bike on transit equipment is provided. Specific examples of modal interconnectivity follow.

The existing class II bike lanes on Hollister Avenue and Modoc Road would provide a direct link to the proposed transit station in the vicinity of Five Points just east of the intersection of Hollister and Modoc Road, and the existing Maria Ygnacia Creek bike path on Patterson Avenue at the railroad tracks would provide direct access to the Patterson Avenue area transit station under the Enhanced Rail Transit package. The existing State Street class II facility and the planned class II facilities in downtown Santa Barbara would be located on Anacapa Street parallel to State Street would provide a parallel route for bicyclists to connect with the existing Amtrak station. Further connections from the proposed express bus flyer station with enhanced transit connections to either downtown Santa Barbara, the Waterfront, or the Santa Barbara City College campus may provide even greater connectivity for bicyclists. Bicyclists who choose to board their bicycles could make connections to the existing class I and II facilities on East Cabrillo Boulevard as well as the other planned and existing bicycle facilities in downtown Santa Barbara.

In the Montecito area, existing class II facilities on Olive Mill Road and San Ysidro Road would provide direct access to either the Olive Mill Road station proposed under the Enhanced Rail package or the proposed flyer stop station at the San Ysidro Road/Highway 101 interchange. North Jameson Lane/Ortega Hill Road/Lillie Avenue/Via Real could provide bicycle access to the proposed freeway flyer stop at the Via Real/Evans Avenue/Highway 101 interchange. In the Carpinteria area existing class II bicycle facilities on Casitas Pass Road and Carpinteria Avenue would provide nearby bicycle access to the proposed rail/transit station at Linden Avenue railroad crossing. Planned class II bicycle facilities on Linden Avenue would provide a direct connection to the Linden Avenue Interchange freeway flyer station as the route is planned to cross Highway 101 and continue to a proposed class I facility along the railroad right of way. The County's plan for a class I bike path along the existing rail Corridor would also enhance travel between stations along the highway and provide for access of freeway transit stops as proposed in under the Enhanced Bus Transit package along the length of the Study Area.

The greatest increase in the percent of automobile trips is predicted for the Pricing/Enhanced TDM Alternatives package. The effect of parking tax costs detailed in Table F-4 above is only partially mitigated by carpooling. Although greater shifts to transit could be expected as a result of the fee, the ability to avoid the cost altogether also applies to nonmotorized transportation modes. The full realization of TDM strategies will also provide incentives for shifts to nonmotorized travel for the home to work trip. Construction of the planned bicycle facilities, as described above and detailed in Chapter 3 will further enhance bicycle travel.

Net Change in Daily Vehicle Trips

Changes in daily vehicle trips are an important indicator with which to compare the effects of the alternatives packages. The reduction in the numbers of vehicles on Study Area roads is a tangible measure of each alternative's success at forestalling the need for the highway widening. The largest reduction (109,000 vehicle trips per day) is predicted with implementation of the Pricing/Enhanced TDM Alternatives package with the parking pricing component. The number of vehicle trips is reduced due to increased carpooling resulting from the \$3/per day parking fee as well as trip reductions realized by requiring all employers to implement demand management strategies including 9/80 and 4/40 modified work schedules and telecommuting. These strategies all focus on the home to work trip. Forty seven percent of the work force is estimated to be participating in one of these three work schedule shifts. The modified work schedules are assumed to improve carpooling opportunities while the telecommunications portion of the

strategy eliminates daily work trips. These aspects of the Pricing/Enhanced TDM Alternatives package have a limited impact on nonwork and tourist based trip making. The preferential parking and parking fee aspects of the Pricing/Enhanced TDM Alternatives program would be expected to reduce non-work drive alone trips as well. Incentives to vacationers, including free transit service for those arriving by modes other than auto, would also contribute to the large reduction in average daily trips predicted for the Pricing/Enhanced TDM Alternatives program.

The Enhanced Rail and Bus Transit packages result in smaller reductions in vehicle trips for several reasons. The primary reason is that in spite of extensive increases in transit services under each package, and increased traffic congestion on Highway 101, the majority of trip makers are forecast to still choose the auto for the majority of their trips. Additionally, the basic TDM element included in these two programs does not provide the same level of incentive to rideshare which would be achieved with the parking fee, modified work schedules and telecommunications elements in the Pricing/Enhanced TDM Alternatives package. Auto trip reductions are directly tied to the increased availability of transit either through the rail or express bus service and the increased service frequencies proposed under either package, which make transit more attractive compared with the auto for some trips.

Measures of Effectiveness

Total Cost, Total Annualized Cost and Total Annualized Cost per Vehicle Trip Reduced

The highest total costs for an alternative are estimated for the either the Highway Widening alternative or the Enhanced Rail transit alternative, depending on which scenario or technology is selected. The total cost of the Highway Widening alternative is estimated to be between \$102 and \$142 million expressed in 1994 dollars based upon the cost estimates provided by Caltrans in the Draft EIR. Total project costs for the proposed rail strategy vary due to the two types of rail technology considered with \$102 million representing the cost-effectiveness of the diesel rail car (DRC) technology and the \$142 million representing the light rail transit (LRT) technology. Higher LRT costs are attributable to the need for construction of the 22 miles of new track, electric power distribution system, and a requirement for a complete LRT storage yard and maintenance shop. These needs are required for either a small or large LRT fleet. Operating and maintenance costs for the DRC are higher than those for the LRT or the Enhanced Bus alternative because of the cost of operating in a shared track environment with Southern Pacific Railroad and Amtrak. These costs are effected by who operates the signals and dispatch systems. Total cost estimates for the rail alternative range from \$134 million for

the DRC based system to \$357 for the LRT based system while total costs for the Enhanced Bus Transit package are estimated between \$43 million and \$47 million. Both costs include the cost of additional buses to serve the revised bus service levels. The higher bus costs are due to estimates for union based operations and maintenance costs if no contract service could be negotiated for the new Highway 101 express bus service.

Total cost of the Pricing/ Enhanced TDM Alternative is the lowest of all alternatives evaluated except the No Build. Costs are associated with the administration of TDM programs estimated from cost information provided by Traffic Solutions, and the cost of providing incentives to tourists or visitors to the Santa Barbara area.

The annualized cost of the Highway Widening alternative ranges from between \$11 million to \$15 million per year. As trips are predicted to increase under the Highway Widening alternative, no cost effectiveness measure of annualized cost per vehicle trip reduced can be calculated. Of the three alternative packages evaluated, total annualized costs of the Pricing/Enhanced TDM Alternative are estimated at \$5 million per year. The most "bang for the buck" is achieved with the Pricing/Enhanced TDM Alternative. The total annualized cost per vehicle trip reduced is \$0.17, or less than a quarter, under the Pricing/Enhanced TDM Alternative. Annualized costs for the Enhanced Bus alternative and resulting cost effectiveness are forecast to be slightly higher than those achieved by the Pricing/Enhanced TDM Alternative. The Measures of Effectiveness ("bang for the buck") for the enhanced bus transit package have been calculated as an estimated total cost per vehicle trip reduced (in 1994 dollars) of between \$2.31 and \$2.59. This is 12 to 14 times higher than the cost per vehicle trip reduced by the TDM alternative. The total annualized cost of the Enhanced Bus alternative is estimated at between \$5.5 million and \$6.0 million and the total annualized cost per vehicle trip reduced, is also the highest of the three alternatives - ranging from \$3.81 to \$5.70 per vehicle trip reduced. The detail provided in the following section underscores the sources of the cost effectiveness balance between alternatives.

Annualized Capital and Operating and Maintenance Costs per Vehicle Trip Reduced

No capital costs within the Corridor are associated with the No Build alternative. Capital costs for the Highway Widening alternative exceed the operations and maintenance costs for this alternative. Operations and maintenance costs for the No Build and the Build are assumed from between \$500 to \$2,000 per lane mile per year depending on the type of concrete (Chuck Gaunt, Caltrans District 10, personal conversation, 1994). This is estimated at approximately \$96,000 per year for the No Build and \$144,000 per year for the build alternatives (1994 dollars). As before, the absence of any reduction in vehicle trips due to

either of these alternatives makes a comparison of annualized capital, operations and maintenance costs per vehicle trips reduced impossible.

The Pricing/Enhanced TDM Alternatives program's capital costs contribute an annualized cost of \$0.15 per vehicle trip reduced while the operating and maintenance costs contribute \$0.02 per trip reduced. The absence of expensive construction costs keeps the lid on the overall costs. This cost effectiveness evaluation also does not estimate the additional revenue generated by the parking fee program which is estimated at potentially between \$25 and \$50 million per year. The Pricing/Enhanced TDM Alternatives program is, however, expected to generate revenue which would cover the estimated operations and maintenance costs, including the costs of proposed promotions and discounts for tourists and visitors to choose modes other than the auto for trips to and within the South Coast.

Annualized capital cost per trip reduced for the Enhanced Bus alternative are estimated as half of those for the Enhanced Rail alternative on the low end of the estimate and nearly five times greater than those capital costs estimated at the high end. It is with capital costs that differences between the bus and rail strategies are the most dramatic. The estimated annualized capital cost per vehicle trip reduced is \$1.56 for the DRC technology and \$4.15 for the LRT. The corresponding annualized capital costs per trip for the Enhanced Bus alternative range from \$0.80 to \$0.88 cents per trip. The Enhanced Rail alternative results in annualized capital cost effectiveness rate per trip reduced which are estimated at from ten to thirty times more expensive than those achieved by the TDM alternative while the Enhanced Bus alternative results in differences which are three to four times more expensive than the TDM alternative.

Forecast annualized operating and maintenance costs for the Enhanced Bus alternative is between \$10 to \$12 million (1994 dollars) per year, depending upon the amount of enhanced service forecast to be operated by private contractors as compared with MTD operation. However the annualized Enhanced Bus alternative's operations and maintenance costs are a result of the lower operations costs than those estimated for the Enhanced Rail. The cost of even non-contract bus operations can be expected to be less than the cost of the jointly shared track operations. The estimated annualized operating and maintenance cost per trip reduced is \$1.56 for the LRT technology and \$2.15 for the DRC technology. These estimates were based on conversations with joint track use operations in Washington State, Oregon, and San Diego County's North County Transit District. Differences between the Enhanced Bus and Rail alternatives on the operations and maintenance side range from a five cent to nearly a seventy five cent difference per vehicle

trip reduced.

Measures of Environmental and Community Impact

Air Quality

Emissions from vehicles are expected to be produced at the highest levels under the No Build alternative for all four of the criteria pollutants evaluated. Levels of ROG and NOx, precursors of ozone, more than double over the 1992 levels estimated based on forecast VMT. The primary source of CO in the air basin is motor vehicles. Daily running vehicle emissions under the 2015 highway widening alternative are estimated to produce 23 percent less ROG and 7 percent less NOx than those running emissions generated under the No Build alternative. Improved travel speeds as well as improved emissions levels from cars due to increased emission controls both contribute to the reduced levels. (Improved vehicle emissions levels will apply to all alternatives.) CO emissions from "running emissions" (no cold start or "hot soak" emissions included here) are predicted to be reduced by 24 percent and particulate matter is predicted to be reduced by 18 percent from those generated under the No Build alternative. Running emissions are tail pipe emissions from running vehicles. Hot soak emissions result from evaporation of fuel off of a warm engine after a vehicle is stopped.

Daily vehicle running emissions levels for the Enhanced Bus Transit package are approximately 26 percent less for ROG and 14 percent less for NOx than those predicted for the No Build alternative. These reductions would help to decrease ozone formation. Levels of CO generated by vehicles would be decreased by 36 percent and particulate matter levels generated by vehicles would be decreased by 28 percent.

Daily running emissions estimates for the Enhanced Rail Transit package are essentially the same as those achieved under the Enhanced Bus Transit package. Implementation of the Enhanced Rail package is forecast to result in a 30 percent reduction in vehicular ROG emissions per day and a 16 percent reduction in vehicular NOx emissions over levels estimated for the No Build alternative. These reductions are slightly better than those estimated for the Enhanced Bus Transit alternative due to the slightly lower number of vehicle trips made and the associated numbers of vehicle miles traveled. Estimates of reductions in vehicular CO emissions between the Enhanced Rail Transit alternative and the No Build alternative are 17 percent lower under the rail package and are 2 percent lower for Particulate Matter under the rail package.

Forecast vehicle emission reductions are greatest for the Pricing/Enhanced TDM Alternative. A 34 percent reduction in ROG emissions and a 21 percent reduction in NOx emissions is

predicted. CO pollutants would experience the greatest decrease (35 percent) while particulate matter reductions are predicted to be reduced by 31 percent. The large forecast reduction in vehicle trips accounts directly for the higher emission reductions under this package. Reduced levels of congestion on Highway 101 also contribute to the overall emissions reductions from the Pricing/Enhanced TDM Alternative. However, the emission reductions gained by the absence of any congestion on Highway 101 under the Highway Widening alternative are lost due to the increase in daily VMT of the widening alternative over the Pricing/Enhanced TDM Alternative. Simply put, the fewer vehicle trips that are made, the greater the emissions benefit.

Energy Consumption

Transportation energy consumption increases with the forecast amount of VMT. The greatest energy consumption impact would result from the Highway Widening alternative. The Enhanced Bus, Rail and TDM alternatives result in proportionately lower levels of energy consumption according to their predicted levels of VMT. Direct energy consumption of automobiles under the Enhanced Bus and Rail alternatives results in between 1.35 and 1.4 percent less energy consumption than levels predicted under the No Build alternative. The Pricing/Enhanced TDM Alternative would result in the lowest energy consumption levels of all of the alternatives, approximately eight percent below the No Build. Lower energy consumption levels are associated generally with changes in the weekday home to work trip making and are not a result in changes to the tourist or weekend travel.

Neighborhood Intrusion/Impact on Community Character

Change in ADT on parallel streets. Application of the rating system for changes in traffic volumes on parallel streets in the Highway 101 Corridor is based on traffic volumes and roadway segments identified in Table F-3. The results of the evaluation system are listed in Table F-5. The Highway Build alternative results in the largest reductions in ADT on parallel streets due to the added capacity on the highway itself, the resulting reduced congestion, and increased speeds. Only marginal reductions (2-3 percent) in daily traffic are predicted for the parallel arterials under either the Bus, Rail or Pricing/Enhanced TDM Alternative.

Although congestion is reduced on Highway 101 as a result of the Pricing/Enhanced TDM Alternative, the resulting average speed of approximately 32 miles per hour does not provide enough of a travel time incentive for all motorists to remain on Highway 101. Travel times for drivers using the parallel road system will compete with those staying on Highway 101 if the Pricing/Enhanced TDM Alternative were implemented.

Land uses on Highway _____192, including Sycamore Canyon and

East Valley Roads, include low density residential and a limited neighborhood commercial center at the intersection with San Ysidro Road. Cold Spring School and a fire station are located along Sycamore Canyon Road, while two churches and several recreational clubs are located on East Valley Road. Old Coast Highway and Coast Village Road in the Santa Barbara area are both predicted to carry increased traffic in 2015. Land uses on Old Coast Highway include medium density residential and the Municipal tennis courts, along with the back side of the Montecito Country Club. Coast Village Road land uses include tourist and neighborhood commercial businesses with on-street parking. If these land uses remain similar to those found on Coast Village Road today, on-street parking conflicts with increased traffic volumes may occur, and it may be more difficult to travel through this area as congestion increases. On Cabrillo Boulevard, east of Milpas Street, land uses include visitor serving hotels, medium density residential, and recreational facilities such as the East Beach, the Andre Clark Bird Refuge, the Santa Barbara Zoological Gardens and the Santa Barbara Cemetery.

Changes in Bus/Train Service Frequencies. New bus routes and increased service on existing routes, proposed as part of either the Enhanced Bus or Rail Transit packages, are expected to increase vehicular noise locally along the streets that are traversed by these routes. This noise would be the most intrusive in residential areas, particularly single family residential areas. Table F-6 includes the impact results of the qualitative evaluation tool based on the increase in frequency of bus routes during the week day peak periods. No impacts under this criteria are predicted for the No Build, the Highway Widening, or the TDM alternative. Although some increase in bus service under these alternatives is assumed due to increased growth in the area and MTD's continued service levels, the identification of what service increases would occur on which routes is outside of the scope of this study.

The Carpinteria area would experience the greatest increases in noise from the addition of new or extended bus routes proposed under the Enhanced Bus alternative. Many of the bus route service revisions propose a ten minute headway in place of thirty minute headways. This almost threefold increase during the morning peak period (6:00 AM to 8:30 AM) is expected to be the most noticeable as ambient noise levels are generally lower.

(It is important to remember that this increase results in only six buses per hour per route.) Express bus service on the freeway connecting to existing or new stations is not expected to create disruptions to either residential or commercial areas.

Compatibility with Current Land Uses. Proposed rail or bus station compatibility with existing land uses is listed by station in Table F-6. Current land uses are described in this

section and serve as the basis of comparison for the bus and rail alternatives. The stations of the Enhanced Bus or Rail Transit alternatives are expected to have the greatest impact on community or neighborhood character. Compatibility of proposed stations with existing land uses and local zoning are described.

Table F-6 includes a broad assessment of availability of space for park and ride facilities at proposed station locations. The overall rating for stations associated with the Enhanced Rail Transit alternative is considered compatible due to the types of land uses encountered in the vicinity of each station. A discussion of existing land uses and current zoning capabilities for each of the seven planned or existing multimodal station locations follows:

Carpinteria at the Linden Avenue railroad crossing close to 5th Street. The proposed Carpinteria station is generally located in a commercial area south of the freeway. Space is available to provide a park-and-ride lot to this station within walking distance of this stop. (Definition of Alternatives Technical Memorandum, May 16, 1994). The general commercial nature of this area's zoning designation(s) is compatible with a multimodal transit station.

Summerland near the Evans Avenue entrance to the Look Out County Park. The park area itself is a big bluff with no improved recreational amenities. Land uses in the vicinity of Timberlane and Evans include public and private uses. No space for a park-and-ride lot was identified at this site, though the park does have a small parking lot. A station site would require a "public utilities" zoning designation which the site currently does not have. Proposed changes to existing MTD routes 20 and 14 are not expected to impact neighborhoods in Summerland north of Highway 101.

Montecito at Olive Mill Road. South of the existing railroad tracks is the Biltmore Four Seasons resort while property between the railroad tracks and Highway 101 is zoned both single family and multifamily residential. Properties east of Olive Mill Road are zoned multifamily residential. Changes in the existing MTD Route 14 would not impact the majority of the service of this line within Montecito and would add direct bus service into the immediate vicinity of the station site. The addition of this station is not expected to result in significant disruption in the area immediately surrounding the site.

Downtown Santa Barbara existing Amtrak station. The existing station is zoned Hotel and Restaurant Commercial in a special coastal zone district (HRC2-SD3). This zoning allows all uses which serve visitors. The current site is served by the State Street Shuttle for trips to and from Downtown. Proposed new shuttle access to the site should be easily

accommodated. No conflicts with the increased service at this station location are anticipated.

Hollister Avenue and Modoc Road near the State Street Railroad overpass. The triangular area closest to the railroad overpass is zoned Neighborhood Commercial (CN) which allows current uses such as those in the recently rebuilt commercial area. North of Hollister Avenue up to Highway 101, properties are zoned C3 with newly constructed apartment buildings and residential development at densities of ten units to the acre. Densities along Modoc Road are currently at 20 units per acre. Higher density residential land uses are compatible and supportive of transit station locations. Current service to this site by MTD routes 6 and 11 will support the transit station location. The extension of Route 5 along Modoc Road and Hollister Avenue will further support this station. Increases in service levels along these more densely zoned streets is generally not expected to conflict with the land uses allowed in these zones. The provision of a park and ride or kiss and ride facility at this station is expected to enhance use of both rail and supporting transit service by local residents.

Goleta at the Patterson Avenue underpass. Properties located south of the railroad and west of the underpass are designated Light Industrial (M1). Permitted uses include a variety of manufacturing activities, such as building material fabrication, while residential uses are prohibited. In addition, Public Utility (PU) Services - the zone which allows transit stations, is also permitted. On either side of Patterson Avenue properties are zoned Residential 8 which is a medium density zone permitting up to 8 units per acre. North of the overpass the area is generally developed in residential land uses with some corner neighborhood commercial permitted. Current zoning is compatible with a station location. The potential for park and ride service at the site due to available land within walking distance and the existing service provided by MTD Route 8 support station siting in this area. Capacities on State Route 217 will support the added traffic of the proposed Route 217 Shuttle to UCSB.

Isla Vista at the Storke Avenue/Glen Annie Road railroad underpass. Zoning to the southwest of this site includes the Public Utilities (PU) zone, which allows station siting, and land uses on properties to the south include storage tanks and a mobile home park with an affordable housing overlay. Across Storke Road properties are zoned Industrial Research Park (MRP) which allows manufacturing of light materials, packaging, printing and recreational facilities. These zones would be compatible with station uses. Access to the site from MTD Routes 12 and 25 and the proposed extension to the UCSB Shuttle Route 27 to serve this station are not expected

to impact the industrial land uses in the vicinity.

Bus Flyer stations are assumed to require limited space for drop off and pick up. The remaining bus transfer stations are located at existing bus stops. Space for park-and-ride lots appears to be available within walking distance to proposed bus flyer stops at the Highway 101 at Linden station, the State Street at La Cumbre Road station, the Hollister Avenue at Ward Memorial station, and at the Storke at Glen Annie stations of the Enhanced Bus Transit alternative.

All stations would require further site-specific evaluation. Provisions for auto and bus transit ingress and egress would need to be examined. At several locations extensive redesign of the existing arterials and local streets would be needed to make such candidate locations viable.

The *Caltrans Highway 101 Widening Project DEIR* (Caltrans, 1993) states that the project will not impact access to schools or recreational facilities in the area. Under one scenario, the women's rehabilitation shelter will have to be relocated. The report further states that "specific neighborhoods that will be affected by the project ultimately depends on the alternative and design variation selected. The impacts to these neighborhoods will stem from a change in character traffic patterns and land use. Neighborhoods that have the potential to be impacted include the Southbound side of Route 101 in the Olive Mill Road area and the north and southbound side of Route 101 between Linden Avenue and Casitas Pass Road in Carpinteria." (Caltrans, 1993)

Community impacts to neighborhoods are not expected to result from the Pricing/ Enhanced TDM Alternative. No new facilities are proposed and increased bus service needed to serve the additional riders is very low when compared with either the Enhanced Rail or Bus Transit alternatives. Therefore, no intrusions into neighborhoods are predicted.

Compatibility with Long-Term Comprehensive Planning

Land use policies and land use designations of properties adjacent to either Highway 101 or proposed station locations proposed under either the Enhanced Rail or Bus Transit are used to develop an evaluation of each alternative's compatibility with long term comprehensive planning for the County, the cities of Santa Barbara and Carpinteria, and the Montecito Community. Both the City and County of Santa Barbara's general plans and Carpinteria's general plan recognize the need for expanded carrying capacity in the Highway 101 Corridor to accommodate projected increase in travel demand (Caltrans, March 1993). Express bus service in the freeway would increase the person trip carrying capacity of the Corridor. Enhanced and expanded local bus service will provide additional service capacity

between portions of the Study Area which is predicted to further accommodate travel demand in the Corridor. Therefore this alternative is considered compatible with the local plans.

Statements and recommended goals in the City of Santa Barbara's Circulation Element Update Task Force's Draft Vision Report (September 6, 1994) do not specifically mention the Highway 101 Corridor or Caltrans' proposed widening. The draft recommendations do, however, include several goals which could be interpreted as supporting alternative solutions to traffic growth in the City of Santa Barbara. These goal statements include:

Strive to achieve equality among all modes of transportation;

- . Increase the availability and use of transit;
- . Increase biking and walking;
- . Reduce the use of the automobile for drive-alone trips;
- . Increase parking availability and access for downtown customers; and
- . Develop a circulation system that will carry all modes of transportation from pedestrians to automobiles.

The above goals have not been formally adopted by the City of Santa Barbara at this time, however they reflect identified community concerns and priorities currently under consideration.

It should be noted that these goals do not address all concerns of the business community at this time and further refinement is being sought. These statements do, however, support the elements and intent of the Enhanced Rail and Bus Transit alternatives as well as the Pricing/Enhanced TDM Alternative. All three of these alternatives seek to increase the role of transit, biking, walking, or ridesharing in meeting future transportation demand. The greatest reductions in SOV trips, as described above, would be achieved with the Pricing/Enhanced TDM Alternative.

The proposed rail station at Hollister Avenue at Modoc Road includes land use designations with densities which support a transit station. In the Goleta area, land use designations in the vicinity of Hollister Avenue and Patterson, south of the railroad are Light Industrial, a compatible use with either the Bus or Rail transit stations proposed in this general area. Further west in the Isla Vista area, land use designations in the vicinity of the Storke Road/Glen Annie railroad underpass support industrial or public utility uses. In the Storke Road at Hollister Avenue area, land use designations include industrial compatible with research parks. These designations are all compatible with proposed rail transit station siting.

Carpinteria's General Plan states that the city will encourage

Caltrans' expansion of Highway 101 to a six lane configuration to meet future freeway needs of the Carpinteria area. Land use designations in the vicinity of the proposed bus flyer stop are generally commercial south of the freeway. Both the bus and rail station locations would be considered compatible with this designation.

Montecito's Community Plan Update (September 1992) designates land uses on the north side of Highway 101 between Olive Mill Road and Santa Rosa Lane as residential with allowable densities of 1.8 dwelling units per acre. South of the freeway in this area, land use designations include residential densities of 3.3 dwelling units per acre with and without an affordable housing overlay. East of Rosa Lane on both sides of Highway 101, land use designations are for residential densities of one dwelling unit per acre. Designations north of the Sheffield Interchange include the communities' highest density areas, including residential areas of 4.6 dwelling units per acre and 12.3 dwelling units per acre. The proposed bus flyer stop at San Ysidro would be consistent with land use designations on either side of the highway. Land use designations at the proposed rail station at Olive Mill Road and Santa Rosa Lane would be consistent with the land use designations of residential allowing 12.3 dwelling units per acre with and without an affordable housing overlay.

In the Summerland area, the Evans Avenue station area is located next to Look Out County Park, a recreationally designated land use. This land use is consistent with either the Enhanced Bus or Rail Transit alternatives.

Vegetative Cover

No impacts to vegetative cover within the Corridor are expected under the No Build alternative as there is no construction associated with this alternative and therefore no removal of any vegetation. Caltrans' Draft EIR (March 1993) summarizes the impacts of the highway widening on vegetation stating "loss of many of the mature trees is unavoidable and substantial." The removal of some mature trees is also predicted for the areas of the bus flyer stops. These stations are expected to be on and off stops adjacent to the highway at existing interchanges. The amount of mature vegetation to be removed under this alternative would most likely be less than that associated with the full highway widening approach and median plantings would not be impacted. Impacts on vegetative cover are considered negative as express bus station locations within the freeway Corridor would result in removal of trees and shrubs which have achieved maturity and substantial height. The screening benefit against noise, glare and visual intrusion would be reduced through the loss of these trees. Remaining bus station sites have limited vegetative cover and are not expected to have as great a removal of vegetation. Specific estimates of impact and possible

mitigation would be determined in future, detailed implementation studies if this alternative were to be pursued further.

Impacts on vegetative cover from the Enhanced Rail Transit alternative are considered less negative than those resulting from either the Highway Widening alternative or from the Enhanced Bus Transit alternative, as mature vegetation along the existing Highway 101 Corridor will not be disturbed. The ability to place additional track within the existing rail right of way is expected to have limited impact on vegetation along the existing alignment. The greater number of station locations proposed in the Enhanced Rail Transit alternative may result in somewhat more removal of vegetative cover than those proposed for the bus approach. No impacts to vegetative cover are expected from the TDM alternative as no construction is assumed necessary to meet the requirements of this alternative.

No comparison of mitigation for removal of vegetation resulting is possible in this analysis as the conceptual station location and design make it impossible to provide comparable levels of analysis between the highway widening alternative and the other alternatives

EVALUATION SUMMARY

In summary, Table F-7 illustrates the relative performance of each alternative against each of the evaluation criteria. A value of 1 indicates that the alternative performed best on that criterion and a value of 4 indicates that it performed the worst. No overall ranking is computed as that would be based upon a "weighted" average or the sum of the individual criteria for which individual weights have not nor will not be established as described in Section 4.1. In those cases where the values forecast for a particular measure are equal, the same number is given to both alternatives.